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Bristol Bay Assessment

Key Messages

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TOPLINE MESSAGES

1. **EPA SCIENCE**
   Over three years, EPA compiled the best, most current science on Bristol Bay ecology and fisheries into a comprehensive report. The agency put the report through peer review with a panel of independent scientists.

2. **SCIENTIFIC CONCLUSIONS**
   EPA has concluded that large-scale mining in the Bristol Bay watershed poses risks to salmon, wildlife, and Native Alaska cultures. To assess the potential impacts of mining, the agency developed realistic mining scenarios and mine infrastructure based on industry standards and publicly available information specific to the Pebble deposit located at the headwaters of the Nushagak and Kvichak rivers.

3. **TRIBAL FOCUS**
   In 2010, several Bristol Bay Alaska Native villages requested that EPA prevent construction of a large copper and gold mine the tribes believe would threaten salmon resources they depend on. Other tribes requested the agency not take action. EPA needed information about the Bristol Bay Watershed before responding to these requests.

4. **OPEN PUBLIC PROCESS**
   EPA maintained an open public process each step of the way. We reviewed and considered all comments and scientific data submitted during two separate public comment periods.

5. **WHAT'S NEXT**
   As a scientific assessment, this study does not recommend policy or regulatory decisions. It is a technical resource for the public, tribes, and governments who must consider how best to address the challenges of mining and ecological protection in the Bristol Bay watershed.

KEY MESSAGE 1: EPA SCIENCE

Over three years, EPA compiled the best, most current science on Bristol Bay ecology and fisheries into a comprehensive report. The agency put the report through peer review with a panel of independent scientists.

- Several Bristol Bay tribes requested that EPA take action under the Clean Water Act to stop the Pebble Mine development. Others asked us to wait.
- Before responding to these requests, the agency determined the need for a scientific assessment to characterize the biological and mineral resources of the Kvichak and Nushagak River watersheds of the Bristol Bay region and increase our understanding of the impacts of large-scale mining on the region's fish resources.

- EPA is conducting this assessment consistent with its authority to conduct scientific assessments under Sections 104(a) and (b) of the Clean Water Act
- The assessment examines the potential impacts of mining on salmon and other fish in two watersheds of Bristol Bay – the Nushagak and Kvichak – open to mining development, including the Pebble deposit.
- The assessment is intended to inform future government decisions related to protecting and maintaining the physical, chemical, and biological integrity of the watershed.
- The assessment considers three mining scenarios derived from preliminary mining plans published by the owner of the Pebble Deposit. It also considers the possibility of development of other mines in the regionEPA scientists with expertise in Alaska fisheries, mining, geochemisty, anthropology, risk assessment and other disciplines reviewed information compiled by federal resource agencies, tribes, the State of Alaska and scientific institutions from around the world. The information sources include peer-reviewed research published in scientific journals, data from the Pebble Limited Partnership, state agencies, and traditional ecological knowledge from tribal elders.
- EPA scientists integrated this information and evaluated potential impacts to provide stakeholders with a complete picture the risks to the salmon fishery and the native culture from large-scale mining.
- The assessment draws information from more than 700 scientific reference documents
- A scientific peer review panel evaluated the draft assessment. The same scientific peer reviewers evaluated the revised draft to determine how well the Agency addressed their comments and suggestions.
- EPA considered science submitted by citizens, the mining industry, NGOs, and independent scientists.

KEY MESSAGE 2: SCIENTIFIC CONCLUSIONS

EPA has concluded that large-scale mining in the Bristol Bay watershed poses risks to salmon, wildlife, and Native Alaska cultures. To assess the potential impacts of mining, the agency developed realistic mining scenarios and mine infrastructure based on industry standards and publicly available information specific to the Pebble deposit located at the headwaters of the Nushagak and Kvichak rivers.

ECOLOGICAL STATUS

- The Bristol Bay watershed is a largely undisturbed region with pristine headwaters and waterways, and exceptional natural, cultural, and mineral resources.
- The watershed supports all five species of Pacific salmon found in North America: sockeye, coho, chinook, chum, and pink.
- Bristol Bay produces 46% of the average global abundance of wild sockeye salmon, making it the largest sockeye fishery in the world.
- Between 1990 and 2009, the annual average run of sockeye salmon in Bristol Bay was approximately 37.5 million fish.
- It also supports many other fish species, 190 bird species, and more than 40 terrestrial animal species, including bears, moose, and caribou.

MINING RISKS

- EPA reviewed information about copper mining, the nature of the porphyry copper deposit at the Pebble site and publicly available information outlining proposed mining operations for the Pebble deposit.
- To develop mining scenarios we used information about the proposed Pebble Mine submitted by Northern Dynasty to the U.S. Securities and Exchange Commission, as well as other information about modern mining practices from the mining industry.
- The main source of information used to develop mining scenarios was Northern Dynasty's "Preliminary Assessment of the Pebble Project, Southwest, Alaska", which provides detailed descriptions of three mine development cases comprising 25, 45 and 78 years of open pit mining. This information was developed for the Canadian Securities Administrators.
- The scenarios EPA developed were also influenced by the agency's expertise in current mining practices as well as its decades of expertise in mine regulation and clean-up. The scientific peer review panelists who reviewed the mining scenarios verified that the scenarios we developed are realistic.

- Under any large-scale mining scenario, mining such low-grade ore in this location – at the headwaters of pristine waterways - would require the collection, storage and treatment of enormous quantities of wastewater.
- When mining ends, large quantities of waste and wastewater would have to be contained and managed into the foreseeable future.
- Depending on the size of the mine we estimate 24-94 miles of streams and 2–7.6 square miles of wetlands would be destroyed.
- The assessment estimates that because of water drawdown to keep the mine pit from flooding and to prevent discharges of treated water, streamflows would be altered in 9.3–33 miles beyond the mine footprint, affecting fish habitat.
- Polluted water from the mine site could enter streams through uncollected runoff from the waste rock piles and tailings storage facilities.
- A variety of water collection and treatment failures are possible, ranging from operational failures resulting in short-term releases of untreated leachates to long-term failures to operate water treatment systems.
- In the Kvichak River watershed, a transportation corridor to Cook Inlet would cross many streams and wetlands. These habitats are important spawning areas for sockeye salmon, putting sockeye at risk.
- Our scenario included a transportation corridor near Iliamna Lake. Any transportation corridor in this region would impact salmon habitat.
- Without a plan for removal when mining activities cease, the tailings storage facilities and dams are likely to be in place for hundreds to thousands of years, long beyond the life of the mine.
- Available reports from the PLP suggest tailings dam(s) as high as 685 feet. At this height, the tailings dam would be higher than the Washington Monument (citation?).

KEY MESSAGE 3: TRIBAL FOCUS

In 2010, several Bristol Bay tribes requested that EPA prevent construction of a large copper and gold mine the tribes believe would threaten salmon resources they depend on. Other tribes requested the agency not take action. EPA needed information about the Bristol Bay Watershed before responding to these requests.

- The Yup'ik and Dena'ina tribes are two of the last intact salmon-based cultures in the world. They are nutritionally, economically and culturally dependent on them.
- EPA developed the assessment in response to from petitions in 2010 from nine tribal governments requesting EPA prevent mine development.
- Salmon harvests are the cornerstone of Bristol Bay tribes, who have lived off the ecosystem and maintained a salmon-based, subsistence way of life for at least 4,000 years.
- In most villages, almost 100% of residents harvest wild food resources and more than 80% of households receive shared subsistence food resources they subsist on year-round.
- There are 31 Alaska Native Villages in Bristol Bay. Their cultures are inextricably linked to Bristol Bay fish and water resources.
- It has been a priority from day one to engage tribes every step of the way and listen to their input. We met with tribes regularly over the course of the assessment.
- EPA has tribal trust and government-to-government obligations to tribes. There are laws that require us to consult with them on decisions that might impact them.
- Alaska Natives and other residents of these watersheds will be most affected by large-scale mining.
- The Bristol Bay watershed generated nearly $480 million in economic activity in 2009, and provided employment for over 14,000 full- and part-time workers.
- Bristol Bay residents hold one-third of the jobs and earn $78 million from the Bristol Bay salmon ecosystem.
- Virtually all Bristol Bay households use wild foods and the subsistence harvest supports totals about 2.6 million pounds per year.

KEY MESSAGE 4: OPEN PUBLIC PROCESS

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- EPA maintained an open public process each step of the way – we reviewed and considered all comments and scientific data submitted during two separate public comment periods.
- We received 233,000 comments on the first draft and approximately 895,000 comments on the second draft.
- We heard spoken comments at eight public meetings during the first comment period, attended by approximately 2,000 people.
- EPA met with tribes, Alaska Native corporations, mining company representatives, state and local governments, tribal councils, fishing industry representatives, jewelry companies, seafood processors, restaurant owners, chefs, conservation organizations, members of the faith community, and members of Congress over the course of the assessment.
- We received comments from organizations, citizens, tribes and others who support the mine development at the Pebble deposit, and comments that are opposed to development.

KEY MESSAGE 5: WHAT'S NEXT

As a scientific assessment, this study does not recommend policy or regulatory decisions. It is a technical resource for the public, tribes, and governments who must consider how best to address the challenges of mining and ecological protection in the Bristol Bay watershed.

- The assessment will serve as a basis for the EPA's response to the May 2010 request from the nine Bristol Bay region tribes.
- The assessment does not prevent anyone from applying for a CWA Section 404 permit from the US Army Corps of Engineers.
- Should specific mine projects reach the permitting stage, the assessment will enable state or federal permitting authorities to make informed decisions to grant, deny, or condition permits and/or conduct additional research or assessment as a basis for such decisions.

RESPONDING TO DISINFORMATION

- The assessment is based on current permitted mining practices.
- The assessment does not eliminate the need for future NEPA analysis should there be permit applications for large-scale mining.
- Given the low grade of the ore at the Pebble site, we would expect any mine plan, even if it is different from our scenarios, to have elements highly
- similar to our scenarios – a mine pit, storage of waste rock and tailing, contaminated leachate collection and treatment, and a transportation corridor.
- Both our mining scenarios and an environmental assessment for a mine plan submitted by Northern Dynasty to the SEC are hypothetical. Until a mine is built, operated, and closed we will not know the full extent of environmental effects. However, sufficient information regarding the Pebble Deposit and the nature of porphyry copper mining exists to assess the nature of risks to fish, wildlife and cultural resources. Much of the information about how the deposit will be mined is publicly available in an independent report commissioned by Northern Dynasty Mining.
- Regarding the potential for mitigation of environmental damage: Given the pristine nature of the watershed, it would be extremely challenging, if not impossible, to "improve" an already highly functional watershed to compensate for streams and wetlands lost through large-scale mining.
- There are currently economic opportunities in the region. Bristol Bay residents hold 1/3 of the jobs and earn $78 million from the salmon economy. Many residents practice subsistence, which is a full-time job, and earn cash from seasonal employment.
- The assessment is not an analysis of the benefits of mining versus fishing. People on both sides of the issue are concerned with economic development in the area – some would like to see more market sector jobs and many

more are concerned about effects from large-scale mining on sustainable subsistence, commercial fishing, and recreation jobs.

- Although some Bristol Bay communities have lost population, census data from the Nushagak and Kvichak watersheds does not show a significant out-migration.
- EPA has the authority under the Clean Water Act to study potential effects of pollution under Clean Water Act section 104.